

REMARKS

Applicant has studied the office action mailed August 13, 2007 and submits the foregoing amendments and the following remarks. The amendments add no new matter. See original claim 8 and paragraphs [0013]-[0014] and [0017]-[0018] of U.S. Publication No. 2005/0255416.

Rejection under 35 U.S.C. § 103

The examiner rejected claims 1-22 as obvious under 35 U.S.C. § 103 over Buschulte '414 (U.S. Patent No. 4,629,414) in view of Suppes ("Compression-Ignition Fuel Properties of Fischer-Tropsch Syncrude," Ind. Eng. Chem. Res., 37, 2029-2038, 1998) in view of Chen (U.S. Patent No. 4,764,266), Wittenbrink (U.S. Patent No. 6,787,022), Berlowitz (U.S. Patent No. 6,787,022), and Tanasawa (U.S. Patent No. 3,808,802), as supported by any and all of the following "**Clean Alternative Fuels: Fischer-Tropsch**" (EPA420-F-00-036); CARB publication titled "**Appendix IV - Fuels Report: Appendix to the Diesel Risk Reduction Plan**" (October 2000); and WO 01/83648 to Berlowitz et al ("Berlowitz WO").

Response

The United States Supreme Court (the "Supreme Court") has stated an objective analysis for establishing whether claims are obvious under 35 U.S.C. §103:

[T]he scope and content of the prior art are ... determined; differences between the prior art and the claims at issue are ... ascertained; and **the level of ordinary skill in the pertinent art resolved**. Against this background the obviousness or nonobviousness of the subject matter is determined.

Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 17-18 (1966) (emphasis added).

The examiner has not **resolved the level of ordinary skill in the art** and determined the "obviousness or nonobviousness of the subject matter" of the pending claims against this determination, as required under *Graham*. *Id.* (emphasis added).

In fact, it appears that the examiner has not even resolved what the art is. When discussing applicant's arguments at p. 3 of the office action, the examiner identifies the "art" as "**combustion processes**." When discussing Suppes at the top of page 7 and Tanasawa at the bottom of page 8 of the office action, the examiner describes the field of endeavor as the "**liquid**

combustion fuel field of endeavor.” When discussing Chen at the bottom of page 7 and Wittenbrink and the Berlowitz US ‘022 patent at the top of p. 8, the examiner describes the field as the **“Fischer-Tropsch-derived fuel field endeavor.”**

Applicant respectfully requests that the rejection be reversed. In order to establish a case of *prima facie* obviousness, the examiner must first resolve the level of ordinary skill in the art, and only against this background establish a case of *prima facie* obviousness. *Id.*

-Amendments

In commenting on Applicant’s arguments, the examiner states that “applicant’s remarks directed to diesel fuel are not commensurate with the scope of the claimed invention, since it appears that applicant’s claimed fuel (Fischer-Tropsch derived) is the same as, or at least cannot be distinguished from, the prior art diesel fuel.” Office Action, p. 4.

All of the independent claims have been amended to clarify that they are directed to providing or supplying to a blue flame burner “a Fischer-Tropsch-derived fuel comprising about 40 wt.% or more of a Fischer Tropsch product comprising about 80 wt % or more of iso-paraffins and normal paraffins” and “performing one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.” See claims 1, 14, 16, and 18. The amendments do not add new matter (see original claim 8 and paragraphs [0013]-[0014] and [0017]-[0018] of U.S. Publication No. 2005/0255416). The examiner cannot establish a case of *prima facie* obviousness of the amended claims over the cited references.

In an effort to establish a case of *prima facie* obviousness of these method claims, the examiner points to (a) references describing diesel fuel comprising a “Fischer-Tropsch derived product” and (b) references describing blue flame burners. However, United States Supreme Court has made it clear that [a] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, *independently*, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. _____, 127 S.Ct. 1727, 82 U.S.P.Q.2d 1385, 1396 (U.S. 2007) (emphasis added). In order to establish that a claim is obvious, the examiner must establish that the claims are directed merely to “the predictable use of prior art elements according to their **established functions.**” *Id.* (emphasis added). The examiner cannot establish that it was an established function

of a diesel fuel to be provided or supplied to a blue flame burner to “perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.”

Where, as here, the examiner relies on a combination of references, the examiner must establish an apparent reason to combine known elements **in the fashion claimed**. *Id.* (emphasis added). The examiner cannot meet this burden.

-Chen

Chen does not teach the claimed process comprising providing or supplying to a blue flame burner “a Fischer-Tropsch-derived fuel comprising about 40 wt.% or more of a Fischer Tropsch product comprising about 80 wt % or more of iso-paraffins and normal paraffins” and “performing one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.” See claims 1, 14, 16, and 18.

Chen does state that “regulations controlling the permissible lead content in motor gasoline will necessitate the production of high octane naphtha and requirements for low sulfur middle distillates, especially diesel fuel and **home heating oil** is expected to lead to more stringent specifications for those products also.” Chen, col. 1, ll. 31-36 (emphasis added). Chen also states that “there is a continuing need to develop improved processing techniques for converting residua, gas oils and other high boiling materials to naphtha, middle distillates such as diesel fuel, jet fuel, **home heating oil**, light fuel oil and the like.” Chen, col. 1, ll. 51-55 (emphasis added).

Chen states that “the invention relates to refining of petroleum hydrocarbons and more particularly to a two-stage integrated hydroprocessing scheme in which high boiling petroleum feedstocks may be converted to relatively lower boiling products including high quality naphthas and middle distillates, including jet fuels, kerosenes, and light fuel oils.” Chen, col. 1, ll. 7-15. In the detailed description, Chen explains that,

[a]s a generalization, the aromatic content of the feeds used in the present process will be at least 30, usually at least 40 weight percent and in many cases at least 50 weight percent. The balance will be divided among paraffins and naphthenes according to the origin of the feed and is previous processing. Catalytically cracked stocks will tend to

have higher aromatic contents than other feeds and in some cases, the aromatic content may exceed 60 weight percent.

Chen, col. 7, ll. 12-20. Chen states that “[t]he objective of the hydrocracking which is carried out in the first stage of the operation is to provide a feed with a relatively high concentration of paraffins for processing in the second stage over the zeolite beta based catalyst.” Chen, col. 8, ll. 47-51. Chen explains that

By operating with an aromatic-selective, naphtha directing catalyst under conditions of low to moderate severity, **a major proportion of naphtha product** boiling below about 165° C. (330° F.) may be produced, containing a relatively high quantity of naphthenes which render it valuable for reforming to make high octane gasoline. In addition, **a small to moderate quantity of middle distillate** is produced together with a high boiling fraction. The naphtha directing, aromatic selectivity of the first stage hydrocracking catalyst effectively **concentrates paraffins in the unconverted (to naphtha) fraction and the unconverted fraction is converted in the second stage of treatment to high quality, low pour point distillates by treatment with the zeolite beta catalyst.**

Chen, col. 43-49 (emphasis added). Finally, Chen explains that “[t]he paraffins in the feed are less subject to conversion during this part of the process and so they remain in the higher boiling (above naphtha) fractions¹ which are then selectively processed in the second step over the paraffin-selective zeolite beta to form the desired highly iso-paraffinic product.” Chen, col. 10, ll. 10-15.

Chen states that “[i]f the stage hydrocracking is operated in a distillate selective mode under conditions of low to moderate severity with low to moderate hydrogen pressures . . . the converted fraction will comprise a major proportion of middle distillates . . . with lesser proportions of naphtha.” Chen, col. 10, ll. 16-23. Chen describes this “first middle distillate fraction” as “**quite aromatic in character** and [] generally unsuitable for use directly as jet fuel or diesel but may be used as a blending component for diesel fuels if combined with other, more highly paraffinic components.” Chen, col. 10, ll. 23-29. Chen states that this middle distillate fraction, which is “quite aromatic in character,” is “relatively low in sulfur and generally meets

¹ “Naphthenes” are cycloparaffins. See Hawley’s Condensed Chemical Dictionary (14th Ed. 2001), p. 772 (“the term *naphthene* is misleading and obsolete. See cycloparaffin.”)

product specifications for use as a light fuel oil, e.g., **a home heating oil.**” Chen, col. 10, ll. 30-

32. **This is the portion of Chen cited by the examiner.**

Chen does states that “treatment of [the first middle distillate] in the second stage with zeolite beta results in a significant increase in distillate yield in quality since the paraffins which remain in the unconverted, hydrocracked fraction, are selectively converted in the second stage to lower boiling products with a high content of isoparaffins.” Chen, col. 10, l. 36-41. Chen also explains that:

By isomerizing the high boiling fraction from the first stage either in a hydroisomerization step or a combined hydrocracking/hydroisomerization step in the second stage, the quantity of premium quality middle distillate is greatly increased and in particular, the distillate produced is **highly paraffinic with a low pour point.**

Chen, col. 10, l. 68-col. 11, ll. 7 (emphasis added). However, the examiner cannot establish that this highly paraffinic distillate from the second stage is described for use as a home heating oil.

Chen does not provide evidence that it was an established function of “a Fischer-Tropsch-derived fuel comprising a reaction product of about 40 wt.% or more of a Fischer Tropsch product comprising 80 wt.% or more of iso-paraffins and normal paraffins” to “perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses.” Nor does Chen establish that the claims are directed merely to “the **predictable use of prior art elements according to their established functions.**” *Id.* (emphasis added).

-Remaining references

The examiner cannot rely on the remaining references for reasons already of record.

The newly cited references appear to be cumulative. Berlowitz WO relates to “[a] blend useful as a **diesel fuel.**” Abstract. The CARB Appendix states in the first line that “[t]his report addresses the need for and the appropriate degree of regulation of **diesel-engine fuel** for the control of diesel particulate matter (PM) from diesel-fueled engines.” CARB Appendix, p. IV-1. Similarly, the examiner has not established that the EPA fact sheet entitled “Alternative Fuels” even discusses fuels for blue flame burners and/or home heating applications as opposed to fuels

for automotive use.

The examiner cannot establish an apparent reason to combine the cited references **in the fashion claimed**. The examiner attempts to meet this burden by broadly defining the field as the field of “combustion processes,” arguing that “**the person having ordinary skill in the art of combustion processes** would have been, at the time of the invention, well aware of the concerns that all types of combustion processes (**i.e.-including internal combustion, industrial and residential**) producing relatively high levels, or indeed any carbon emissions (carbon monoxide and/or carbon dioxide), also result in a negative impact on the environment, when concentration levels rise in the atmosphere.” Office action, p. 3. The examiner argues that “the person having ordinary skill in the art at the time of the invention would have been motivated toward applying **known and readily available solutions** to this problem.” Office action, p. 3.

The examiner cannot establish (a) that it was **known** that a Fischer-Tropsch-derived fuel having the claimed properties would be efficient and effective as a fuel for blue flame burners, or (b) that a “Fischer-Tropsch-derived fuel comprising about 40 wt.% or more of a Fischer Tropsch product comprising about 80 wt % or more of iso-paraffins and normal paraffins” was “**readily available**” as of July 19, 2002, or earlier (the priority of the application). It is debatable whether even Fischer-Tropsch-derived diesel fuels were “known and readily available” by July 2002. *See* Chevron Technical Review-Diesel Fuels (Chevron), explaining that, at least **as of 1998**, “[t]he *Fischer-Tropsch* process has not seen wide commercial use because it is expensive.” Chevron, p. 22 (emphasis added).²

In any event, the Department of Energy data sheet (the “fact sheet”) cited by the examiner, is objective evidence of what a person of ordinary skill in the art actually would do when confronted with ensuring the safety of combustion equipment--at least as of the date of its publication (which is not clear). At least at the time it was published--persons of ordinary skill in the art would have **redirected undesirable components produced by blue flame burners into the atmosphere**

² *See also* recently issued U.S. Patent No. 7,229,481 entitled “Diesel Fuel Compositions,” issued to Applicant on June 12, 2007, and U. S. Patent No. 7,189,269, entitled “Fuel Compositions Comprising a Base Fuel, A Fischer Tropsch Derived Gas Oil, and an Oxygenate, issued to Applicant on March 13, 2007. (Cited on and IDS submitted herewith).

rather than actually reduce the production of those undesirable components by the blue flame burner.³

The examiner cannot establish that the fact sheet even describes the use of a Fischer-Tropsch fuel in such equipment.⁴ The examiner certainly cannot establish that the fact sheet establishes that it was (a) known that a Fischer-Tropsch fuel could be successfully used as fuel in a blue flame burner, or (b) that the claimed "Fischer-Tropsch-derived fuel comprising about 40 wt. % or more of a Fischer-Tropsch product comprising about 80 wt % or more of iso-paraffins and normal paraffins" was "readily available" to provide or supply to a blue flame burner to "perform[] one or more procedure selected from the group consisting of heating water with the flue gasses by indirect heat exchange in a boiler and directly heating a space with the flue gasses."

The failure of the fact sheet to even mention such a possibility is especially telling given that a Fischer-Tropsch fuel is a reaction product of carbon monoxide and hydrogen⁵ and that using a Fischer-Tropsch fuel would produce the superior result of **both** (a) reducing the production of carbon monoxide and other undesirable components by a blue flame burner, **and** (b) reducing the emission of carbon monoxide and the other undesirable components into the atmosphere.

Applicant respectfully requests that the examiner enter the amendments, and reconsider and withdraw the outstanding rejection.

CONCLUSION

For all of the foregoing reasons, Applicants submit that the application is in a condition for allowance. If the examiner finds the application other than in condition for allowance, the examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 334-5151 x 200 to discuss the steps necessary for placing the application in condition for allowance. The Commissioner is hereby authorized to charge any fees in connection with this paper, or to credit any

³ The fact sheet describes, for example, "a *fan-assisted or powered combustion system*, meaning a small blower forces or draws combustion air and flue products through the furnace and exhausts combustion gases out of the flue to the outside." Fact sheet, p. 2 (emphasis added).

⁴ The fact sheet discusses "[c]ombustion appliances using natural gas, propane, oil, kerosene, or wood." Fact sheet, p.1.

⁵ See, U.S. Patent No. 7,229,481, col. 4, l. 56-col. 5, l. 7.

overpayment, to Deposit Account No. 19-1800 (File No. TS8580), maintained by Shell Oil Company.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Paula D. Morris", written over a horizontal line.

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